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FREQUENTLY ASKED QUESTIONS

GENERAL INFORMATION ABOUT THE DETROIT EXPOSURE AND AEROSOL RESEARCH STUDY (DEARS)

What is the Detroit Exposure and Aerosol Research Study?

The Detroit Exposure and Aerosol Research Study (DEARS) was a three-year field study conducted by the U.S. Environmental Protection Agency (EPA) from 2004 through 2007. Its purpose is to develop scientific information that helps EPA understand how air pollutant concentrations measured at outdoor community air monitoring stations compare to those measured in various neighborhoods and in some residences. This study, which was conducted in Wayne County, Michigan, is part of EPA's ongoing research on how people are exposed to fine particles and air toxics and the conditions that affect their exposures.

Why is the DEARS important to understanding air quality?

The study is contributing to our understanding of how air quality information collected at the community level compares to information collected in a neighborhood and in and around individual homes. Additionally, by completing questionnaires and surveys, the DEARS participants provided EPA scientists with a better understanding of the activities that affect individuals' exposures to air pollutants. Ultimately what scientists learn from the DEARS will help EPA, and others protect human health and the environment.

Why was Detroit selected as the study location?

Detroit has a variety of neighborhoods that might have air characteristics that are different from one another. Wayne County's population enabled us to recruit participants for the study who might live near different types of pollutant sources. Also, the Detroit area has distinct summer and winter climates that may affect how individuals are exposed to various air pollutants. Finally, the study received support and interest from Detroit's local community action groups, State air quality agency and nearby university researchers when it was undergoing development in 2004.

When was the study conducted?

Participant recruitment and field data collections began during the summer of 2004. Collection of all of the field measurements and information was completed by March 2007.

Who conducted this study?

The DEARS was conducted by scientists in the EPA's National Exposure Research Laboratory in the Office of Research and Development. The Michigan Department of Environmental Quality (MDEQ), an EPA contractor, and others provided valuable assistance.

Which neighborhoods in Wayne County participated in the study?

Homes involved in the air monitoring were randomly selected from neighborhoods associated with Southwest Detroit, the Ambassador Bridge, East Detroit, Northeast Dearborn, West Detroit and Belleville. These neighborhoods were selected due to a variety of factors including their distance to potential pollution sources, the number of homes available for successful recruitment, along with the average age and construction type of the home.

How was the DEARS conducted?

The DEARS can be divided into four main parts: personal monitoring, residential indoor monitoring, residential outdoor monitoring, and monitoring performed at a central community site (Allen Park). The personal and residential monitoring involved a total of approximately 130 participants over the three-year period. During each year, approximately 40 new individuals were involved. Their involvement included participating in personal monitoring, allowing indoor and outdoor air monitoring at their residence, and providing information about their daily activities as collected in questionnaires developed for the study. Participation for each individual during their year of involvement included 5 days of summertime monitoring and 5 days of wintertime monitoring. Their information will be compared to air quality information collected from the community-level monitors for the same periods.

Who at the local level was involved in the study?

EPA scientists worked alongside local State of Michigan air quality scientists, university researchers, community organizations, and the participants themselves to ensure local knowledge or involvement in conducting of the study. Organizations that have been involved in the study include the Michigan Department of the Environment (MDEQ), the University of Michigan, the Community Action Against Asthma, and the Arab Community Center for Economic and Social Services. In addition, EPA's contractor employed a large number of local research staff to assist them with collection of the field data. Of course, the DEARS would not have been possible without the vital cooperation and assistance from the people who participated with us in the study. About 130 households volunteered to participate over the three years the study was conducted.

Which air pollutants were included in the study and why?

EPA air monitoring included the collection of information on pollutants such as particulate matter (airborne dust), volatile organic compounds (benzene), metals (iron), select gases (ozone) and certain air toxics (formaldehyde). This list is not all inclusive and simply represents examples of the pollutants studied. Detailed information on the pollutants monitored in the study can be obtained from the DEARS web site at <http://www.epa.gov/dears/images/study-design.pdf>.

What air samples were collected?

Daily air samples were collected inside and outside of the participants' homes as well as from a vest they wore during the study days. Data collected through the vest will enable the EPA to better understand what air pollutants participants were potentially exposed to, what factors influenced how they were exposed, and possibly even the sources of these pollutants. Participants also completed a questionnaire designed to help scientists understand the activities they were involved in throughout the study periods. No biological samples (e.g., urine or blood) were collected from the participants. In addition, daily air samples were also collected from a State of Michigan air monitoring site in Allen Park to allow for a comparison between all of the measurement locations. More information about the participants' involvement is available at <http://www.epa.gov/dears/survey.htm>

Were people participating in the study exposed to air pollutions *because of* their participation in the DEARS?

This research study did not involve intentional or additional exposures of participants to air pollutants other than those normally encountered in their everyday environments and during everyday activities.

How were the people who participated in the DEARS monitoring selected?

Participant households were selected based primarily on where their residence was located. Randomly selected homes had to be from one of the pre-selected neighborhoods which offered scientists a wide range of environmental conditions to study. The study included adults 18 and older who lived in single-family homes (e.g., not apartments), who were physically able to move around on their own, nonsmokers, and capable of providing informed consent concerning their participation. Selection criteria had no exclusion based on race, sex, occupation, religious affiliation or socio-economic status of participants.

Were there any people exposed to high levels pollutants in there homes? What was done to help them?

A few study participants were found to occasionally have higher than normal exposures to certain air pollutants inside their homes. In all such cases, scientists provided the participants with a written summary which included the type and potential sources of these pollutants. EPA scientists also offered more information at local meetings in Detroit after each monitoring season and through additional mailings to participants.

Can EPA tell me what sources of air pollution impacted my neighborhood?

EPA is in the process of developing the science that will help us understand how regional, local, and potentially even homeowner sources of air pollutants might have impacted outdoor air in the neighborhoods involved in the DEARS.

How is the monitoring information being provided to the participants and the public?

Participants have been provided with summary information following each season of monitoring. Information has also been added to the internet site dedicated to the study (<http://www.epa.gov/dears/>). Detailed information about the methods, models, measurements, and findings will also be available to the research and regulatory communities through the publication of manuscripts in technical journals and at scientific meetings throughout the U.S. and abroad. The local air quality monitoring organization (the Michigan Department of Environmental Quality) has also been receiving updates on early study findings.

Why is the EPA holding this community session now?

The EPA's primary commitment to the participants involved in the DEARS was to provide them with information about their specific air monitoring. This has already been accomplished through information sharing between scientists and participants throughout the DEARS. Even so, EPA wants to provide the study participants, local community leaders, and other interested parties with an update of early findings from some of the air monitoring analyses and at the completion of the field monitoring.

How can people get more information on the DEARS?

Any one can obtain information on the DEARS by contacting Mr. Ron Williams, the EPA Principal Investigator, by calling toll-free at 1-866-EPA-DEAR or by visiting <http://www.epa.gov/dears>. You may also email him at williams.ronald@epa.gov.

What has been learned about harmful gases like ozone and nitrogen dioxide observed in the DEARS?

While the DEARS data were not typically collected in a manner in which they could be directly compared to National Ambient Air Quality Standards (NAAQS), the data indicate that personal ozone concentrations are often 10 times lower indoors than outdoors. This confirms the protective factor people obtain by being indoors during days where the ozone concentrations are expected to be at harmful levels outdoors. Data also reveals that some DEARS participants had much higher personal exposures to nitrogen dioxide (a gaseous pollutant associated with smog and with certain combustion processes) during the winter season in comparison to that observed outside their home. Review of questionnaire data indicated that these individuals often had one or more gas appliances operating in their home. Gas appliances not operating efficiently are known to sometimes create nitrogen dioxide as a by-product of poor combustion. As needed, DEARS participants were provided written summaries of these events and encouraged to have their gas appliances inspected by qualified individuals of their choosing.

Some of the air pollution is from cars. Was that considered in the DEARS? Is that type of pollution coming into my house? Am I exposed to more air pollution if I spend a lot of time near a roadway?

Vehicles that travel along busy roadways may release certain air pollutants as byproducts of the gasoline combustion process or as a result of incomplete combustion. A comprehensive list of compounds emitted by vehicles can be found at www.epa.gov/otaq/regs/toxics/420b06002.pdf. Some of these pollutants are released more frequently and in higher concentrations than others. When a large number of vehicles travel along a highway or interstate, their combined emissions (exhaust and vapors) have the potential to contribute to higher outdoor concentrations of certain air pollutants in areas close to the road. These increased concentrations often decrease quickly with increasing distance from the roadway. Preliminary results in the DEARS and from other research suggests that traffic-related increases in air pollutant levels drop significantly after certain distances are reached (approximately 450 feet from the roadway) and that by approximately 900 feet the pollution levels are almost the same as those found anywhere else in the area. The amount of traffic on a roadway, the type of traffic (cars, buses, etc) as well as the wind direction, wind speed and the local roadway elevation may also be important factors.

What will this study say about any particular local environmental problems?

The DEARS was not designed to identify or provide a remedy for any single environmental issue in the Detroit area. Its purpose was to identify the contributions of various pollutant sources at the community-scale and neighborhood-scale. The DEARS was limited to data collections for short periods of time during the summers and winters of 2004-2007 and from a small number of households in Detroit. As a result, the information gained through the DEARS cannot be generalized to all neighborhoods in Wayne County or the U.S. The study will, however, contribute to our understanding of how air quality information collected at the community level compares to information collected in a neighborhood and in individual homes and how an individual's activities affect their exposures to air pollutants. Ultimately what scientists learn from the DEARS will help

EPA and state regulators develop strategies that reduce pollution and lessen the risks to people and the environment.

When will all the results of the DEARS be available?

EPA scientists have provided this information during a series of participant debriefings held in Detroit over the last three years. Preliminary data analyses are currently being performed on the data from the earliest years of the study. Some of the summaries of these early findings are provided at <http://www.epa.gov/dears/abstracts.htm>. In addition, each DEARS participant has already received a personalized individual data packet summarizing some of the air pollutant monitoring associated with their involvement. However, due to the complex nature of the analyses supporting the study, a complete data set containing fully validated data is not anticipated to be available until sometime after 2010. EPA anticipates publishing data findings as they become available in scientific journals in between 2009-2012.

What particulate matter and air toxics research has EPA already conducted?

During the last decade, EPA and its collaborators have conducted a series of similar studies in Baltimore, MD; Fresno and Los Angeles, CA; Research Triangle Park, NC; Atlanta, GA; Boston, MA; New York City, NY; Seattle, WA; and Tampa, FL. EPA has a broad program of related research as described on the Particulate Matter Research Web site at <http://www.epa.gov/pmresearch/>. Information about other EPA studies being conducted in the Detroit area is available at <http://www.epa.gov/dears/studies.htm>

RELEVANT WEBSITES

- DEARS homepage at <http://www.epa.gov/dears/>
- DEARS homepage for participants at <http://www.epa.gov/dears/participants.htm>
- EPA's Particulate Matter Research Strategy at <http://www.epa.gov/pmresearch/>
- EPA AirNow at <http://airnow.gov/index.cfm?action=airnow.outlook>
- Asthma Triggers (information for caregivers and health professionals) at <http://www.noattacks.org/>.
- Protecting children from environmental health risks at <http://www.epa.gov/children> or [http://yosemite.epa.gov/ochp/ochpweb.nsf/content/OCHP_CEH_Report_2007.htm/\\$file/OCHP_CEH_Report_2007.pdf](http://yosemite.epa.gov/ochp/ochpweb.nsf/content/OCHP_CEH_Report_2007.htm/$file/OCHP_CEH_Report_2007.pdf)
- Michigan State Government at <http://www.michigan.gov/>
- Michigan Department of Environmental Quality at <http://www.michigan.gov/deq/>

CONTACT US

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